We put all our energy into energy efficiency.

ENER-G CHP

Sustainable heating with maximum efficiency

GAS HP 35A HT

remeha
renewable technologies

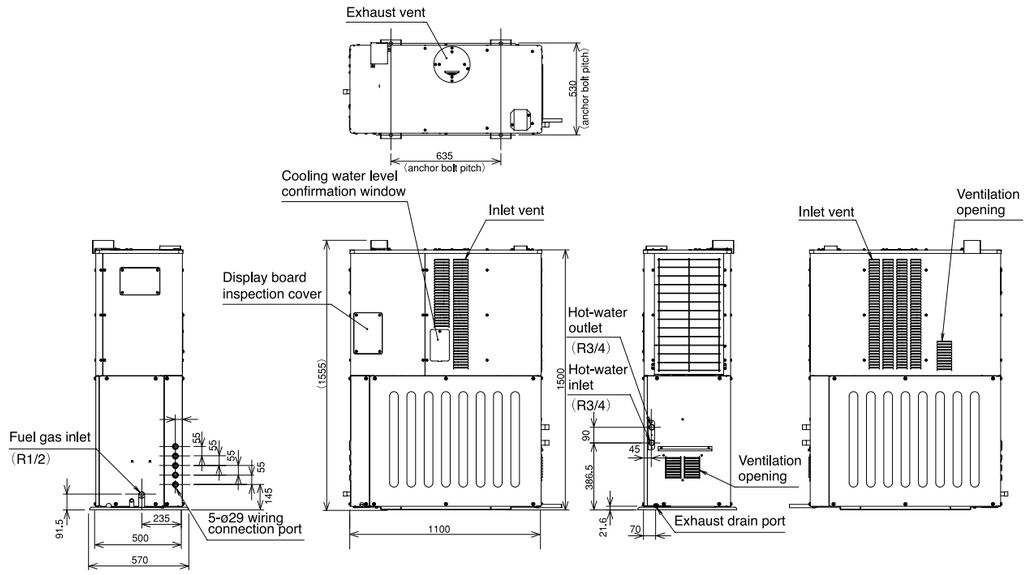
ENER-G4

Boiler Model		**ENER-G4**
Product Code		CP4WE
Dimensions W x D x H	mm	1100 x 500 (570 including protrusion) x 1500 (1555 including cover)
Net Weight	kg	410 (including cooling water and lubricant)
Rated Output	kW	3.87*1
Frequency	Hz	50
Voltage	V	230
Current	A	AC 16.0
Phase/Wires		Single phase, two wires
Power Factor	%	97 or more
Recovered Heat	kW	8.38
Hot Water Temperature		
Inlet	°C	60
Outlet	°C	65
Hot Water Flow Rate	L/min	24.3*2
Total Efficiency	%	84.5
Electrical Generation Efficiency	%	26.7
Exhaust Heat Recovery Ratio	%	57.8
Sound Pressure Level for Rated Load		
Radiator Fan Stopped	dB (A)	51
Radiator Fan Operating	dB (A)	53
—	dB (A)	—
Voltage	ACV	230
Startup Current	A	13 (average electric current)
Power Consumption (Rated)		
Radiator Fan Stopped	kW	0.19
Radiator Fan Operating	kW	0.28
Space Heater (below 5°C)	dB (A)	0.25 (for cold regions)
Fuel Consumption (LHV basis)	kW	14.5*3
Gas Supply Pressure		
Category 2H	mbar	20

1 The heat recovery and efficiency values are those for rated output in standard atmospheric conditions.
2 The operating sound levels are maximum values measured in 4 directions at a point 1m from the side of the unit and 1.2m above the ground in an anechoic room simulation. The sound levels during actual operation are usually higher than the simulated values due to ambient noise and echoes.
3 The values for the external dimensions do not include piping, piping connections, or protruding parts.
4 The amount of fuel consumption is based on lower calorific values.

*1 Power consumption is included
*2 Max of +5%; 25.5l/min
*3 Tolerance +5% is not included

GAS ENGINE UNIT



REMEHA ENER-G4 TECHNICAL SPECIFICATION

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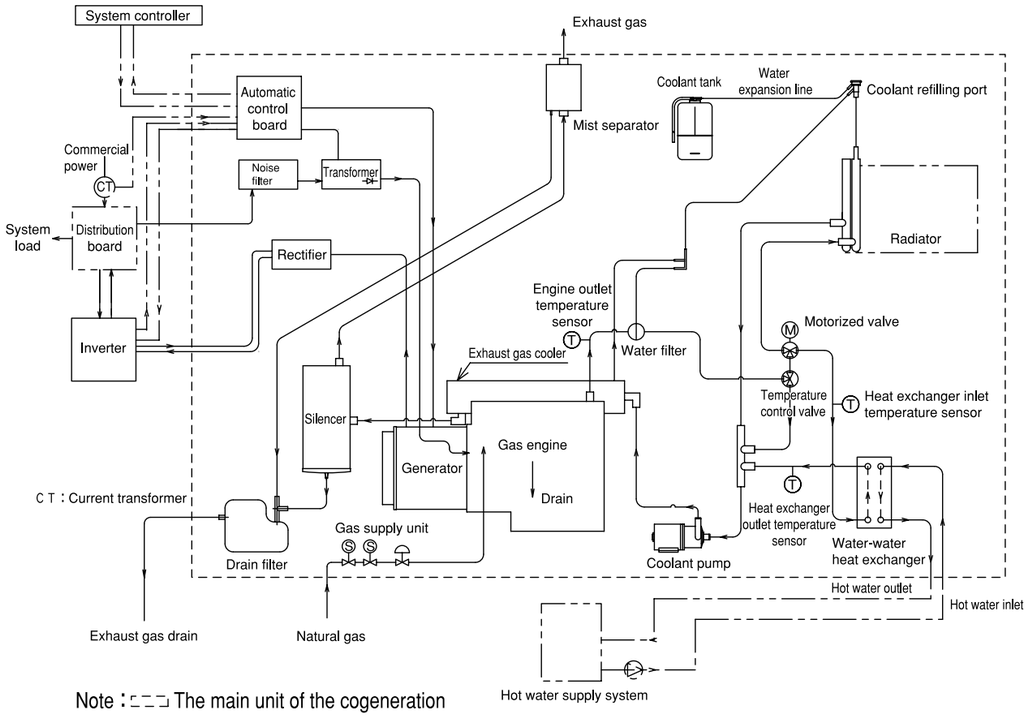
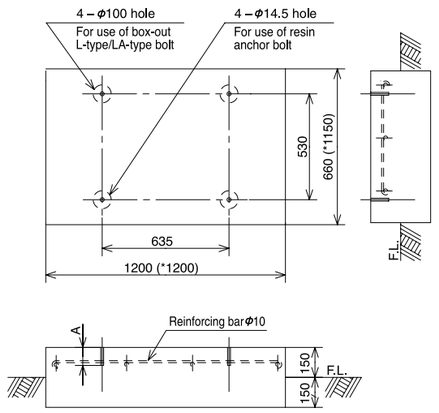
SYSTEM FLOWCHART



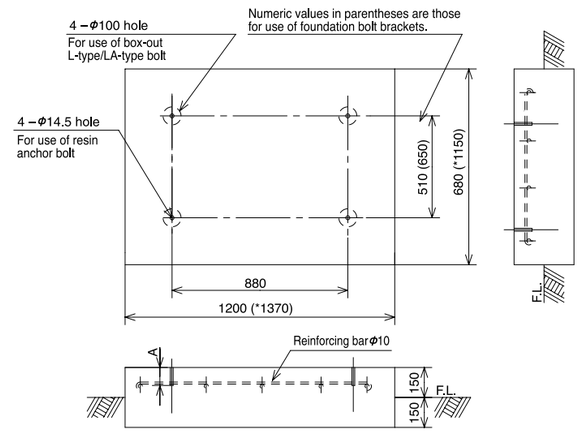
Note : The main unit of the cogeneration package is denoted by dashed lines.

DIMENSIONAL DRAWING OF BASE

1. Direct Mount



2. Anti-Vibration Mount



When the unit is installed indoors, a syphon (option) should be installed.

If the back pressure of the exhaust-piping extension exceeds 500Pa, use a long syphon and make the height of the base from F.L. to 250mm or more.

Type of Anchor Bolt	Size	Embedded Depth A (mm)
L-type/LA-type	M12	150
Resin		90
Male screw mechanical		60

Notes:

1 For use of box-out L-type/LA-type bolt.
When laying the concrete for the base, provide a box-out for fixing the anchor bolts, fix the anchor bolts and then secure them in the concrete.

2 It is sometimes necessary to change the thickness of the base depending on the foundation strength, so carry out the work after consulting construction engineers.

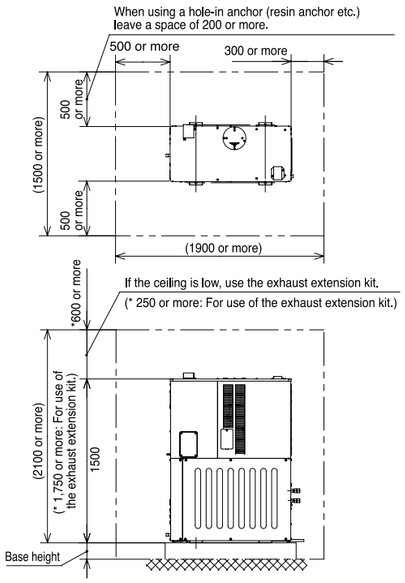
3 Earthquake-resistance strength: Horizontal seismic coefficient of 0.6 (Numeric values with * show the dimensions in the case of a horizontal seismic coefficient 1.0).

4 When using a smaller base, join the base and the structure with reinforcing bars.

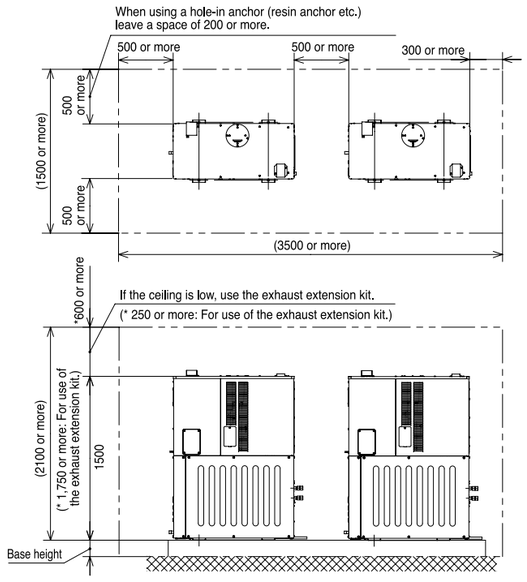
REMEHA ENER-G4 TECHNICAL SPECIFICATION

INSTALLATION SPACE

1. Single Unit Installation


When using a hole-in anchor (resin anchor etc.) leave a space of 200 or more.
500 or more
300 or more
500 or more
(1500 or more)
500 or more
(1900 or more)
If the ceiling is low, use the exhaust extension kit.
(* 250 or more: For use of the exhaust extension kit.)
*600 or more
(2100 or more)
(* 1,750 or more: For use of the exhaust extension kit.)
1500
Base height

2. Multiple Units Installation


When using a hole-in anchor (resin anchor etc.) leave a space of 200 or more.
500 or more
500 or more
300 or more
500 or more
(1500 or more)
500 or more
(3500 or more)
If the ceiling is low, use the exhaust extension kit.
(* 250 or more: For use of the exhaust extension kit.)
*600 or more
(2100 or more)
(* 1,750 or more: For use of the exhaust extension kit.)
1500
Base height

Unit: mm

Notes

1. When surrounding the unit with soundproof walls, attach openings (louvres or the like) to the bottom of the soundproof walls. (To prevent the short circuits of radiating air).
2. Decide installation space after consideration of the piping space.
3. If the distance of retention is specified by local-government fire prevention ordinances and enforcement regulations, secure the installation space according to these regulations.
4. Give consideration not to cause problems for neighbouring houses due to operating noise, radiating air, or hot ventilation air.
5. Depending on the situation, the site may be filled with radiating air and this has an effect on performance. Prevent the short circuits with the optional wind direction boards, etc.

ENER-G4 DATASHEET

General Description	
Fuel Type	Natural Gas
Minimum Methane Number	80
Electrical Output	3.9kW
Heat Output (Exhaust Cooled to 69°C)	8kW
Fuel Input Net/Gross (CV 10kWh/Nm³)	15/16kW
Min/Max Dynamic Gas Pressure	10/25 mbar
Max Return/Flow Water Temp:	55/65°C
Unit Efficiency	84.8%

Prime Mover	
Type	Reciprocating Engine
Combustion Cycle	4-stroke Spark Ignition
Cylinders	3
Speed	2000
NOx Emissions	283 mg/Nm³
CO Emissions	36 mg/Nm³
Aspiration	Natural

Generator	
Type	PMG DC & DC/AC Inverter
Frequency	50 Hz
Voltage	230 V
Phase(s)	1-Phase

Heat Recovery System
Fully closed primary water circuit
Exhaust gas heat exchanger in primary circuit
PHE between primary and secondary circuits.
Primary water pump
Auto heat output modulation

Control and Protection
On board computer control, protection and monitoring
Engine stop/start, synchronising, modulation
Mechanical, electrical and thermal protection
BMS interface signals

Standard Equipment
Internal Exhaust silencers
Secondary water pump

Optional Equipment/Configuration:
Export control panel
Remote monitoring
Heat and gas metering
System controller
Anti-vibration mounts
Exhaust extension kit

Electrical output is based on output at the generator terminals at a power factor of 0.95. Energy quantities subject to reduction when modulating in response to external conditions. We reserve the right to alter the Engine Type, at any time, to meet the system specifications. Performance figures are subject to original Engine manufacturer's declared performance, tolerances and test conditions. Output figures are based on operation at ISO3046 conditions with the exception of the exhaust output, temperature stated above. Technical Datasheets are subject to change, without notice, due to our commitment to on-going product improvement.

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REMEHA ENER-G4 TECHNICAL SPECIFICATION

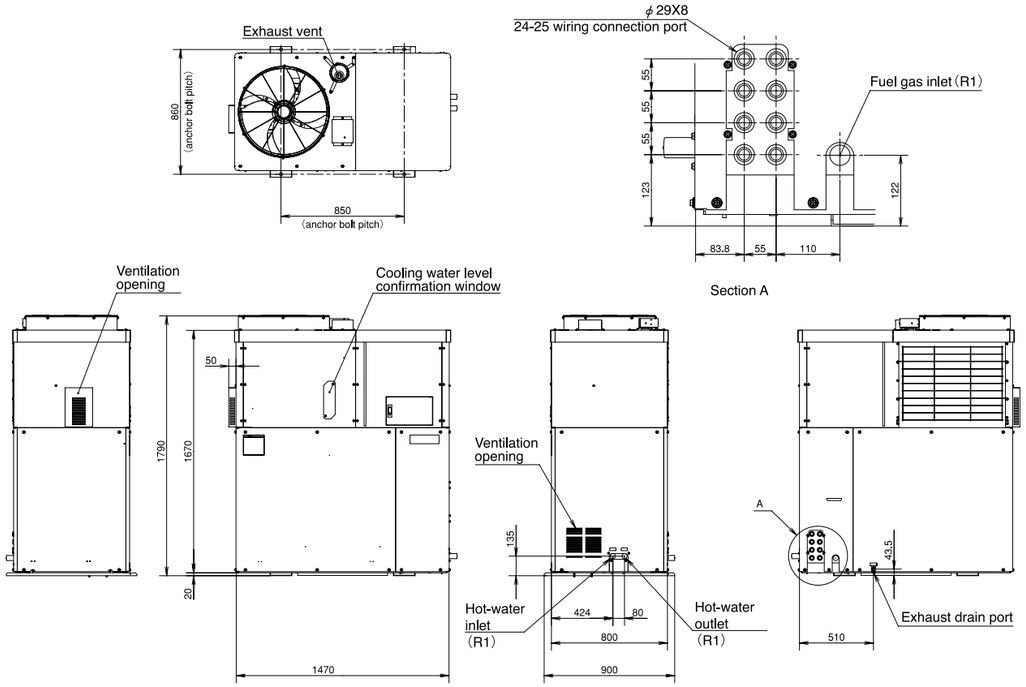
ENER-G10

Boiler Model		**ENER-G10**
Product Code		CP10WE
Dimensions W x D x H	mm	1470 x 800 (900 including protrusion) x 1790
Net Weight	kg	790 (including cooling water and lubricant)
Rated Output	kW	10.00*1
Frequency	Hz	50
Voltage	V	AC400
Current	A	14
Phase/Wires		Three phase, four wires
Power Factor	%	97 or more
Recovered Heat	kW	17.3
Hot Water Temperature		
Inlet	°C	65
Outlet	°C	70 (Max 78)
Hot Water Flow Rate	L/min	48.2*2
Overall Efficiency	%	84.0
Electrical Generation Efficiency	%	30.7
Exhaust Heat Recovery Ratio	%	53.3
For Rated Load		
Radiator Fan Stopped	dB (A)	54
Radiator Fan Operating	dB (A)	56
—	dB (A)	—
Voltage	ACV	230
Startup Current	A	22.6 (average electric current)
Power Consumption (Rated)		
Radiator Fan Stopped	kW	0.28
Radiator Fan Operating	kW	0.53
Space Heater (below 5°C)	dB (A)	0.50 (for cold regions)
Fuel Consumption (LHV basis)	kW	32.6*3
Gas Supply Pressure		
Category 2H	mbar	20

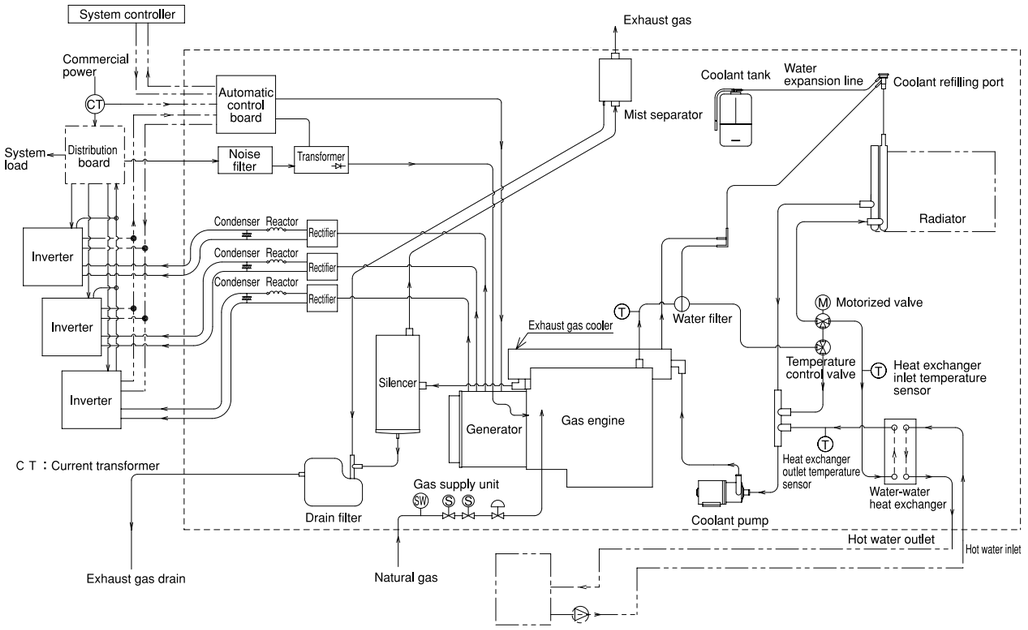
1 The heat recovery and efficiency values are those for rated output in standard atmospheric conditions.
2 The operating sound levels are maximum values measured in 4 directions at a point 1m from the side of the unit and 1.2m above the ground in an anechoic room simulation.
The sound levels during actual operation are usually higher than the simulated values due to ambient noise and echoes.
3 The values for the external dimensions do not include piping, piping connections, or protruding parts.
4 The amount of fuel consumption is based on lower calorific values.
5 As for G83, the examination was carried out by New and Renewable Energy Centre (NaREC) in U.K.

*1 Power consumption is included
*2 Max of +5%; 50.6l/min
*3 Tolerance +5% is not included

GAS ENGINE UNIT



SYSTEM FLOWCHART

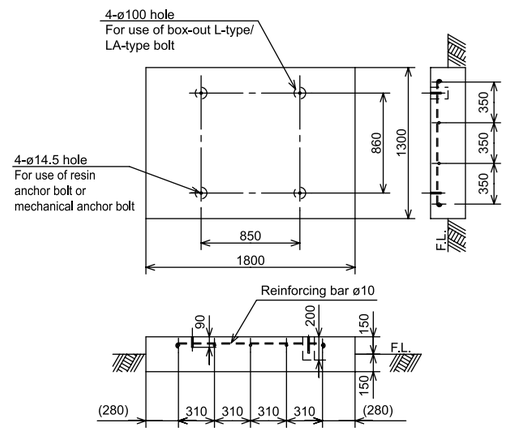


Note: ▭▭▭The main unit of the cogeneration package is denoted by dashed lines.

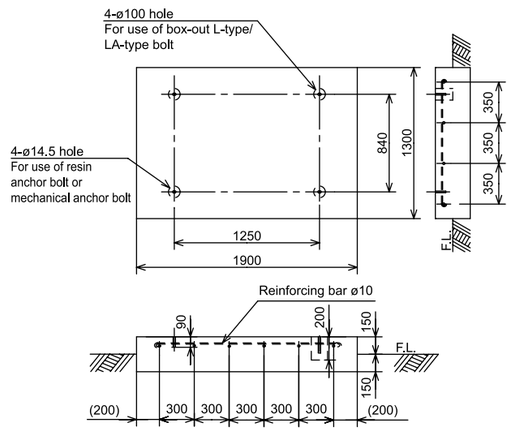
Hot water supply system

DIMENSIONAL DRAWING OF BASE

1. Direct Mount



2. Anti-Vibration Mount



When the unit is installed indoors, a syphon (option) should be installed.

If the back pressure of the exhaust-piping extension exceeds 500Pa, use a long syphon and make the height of the base from F.L. to 250mm or more.

Type of Anchor Bolt	Size	Embedded Depth A (mm)	
		Direct Mount	Anti-Vibration Mount
L-type/LA-type	M12	60 or more	70 or more
Male screw mechanical		60 or more	70 or more
Resin		30 or more	40 or more

Notes:

1 For use of box-out L-type/LA-type bolt.
When laying the concrete for the base, provide a box-out for fixing the anchor bolts, fix the anchor bolts and then secure them in the concrete.

2 It is sometimes necessary to change the thickness of the base depending on the foundation strength, so carry out the work after consulting construction engineers.

3 Earthquake-resistance strength: Horizontal seismic coefficient of 0.6 (Numeric values with * show the dimensions in the case of a horizontal seismic coefficient 1.0).

4 When using a smaller base, join the base and the structure with reinforcing bars.

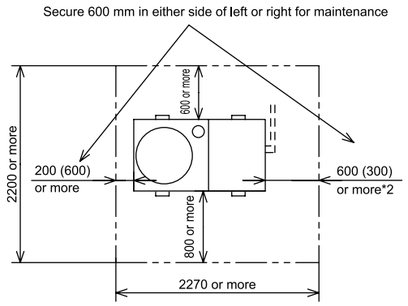
Points to note in constructing the base

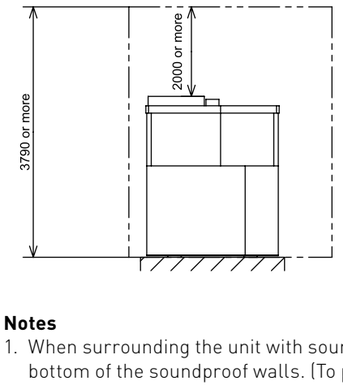
1. Set the standard compounding ratio, cement 1: sand 2: aggregate 4, and insert reinforcing bars of Ø10 (interval: approx. 300mm) into the base.
2. Finish the surface with mortar so that it is flat. Chamfer the edges of the concrete.
3. When setting the base on a concrete floor, rubble is not necessary, but make the concrete surface of such parts uneven.
4. Build the waterway around the base, and pay attention to the drainage around the machine.
5. When installing the unit on a rooftop, be careful about the surface strength, and be sure to make the area waterproof.
6. In places where the soil has a low weight-bearing capacity (clay layer, sand area, loam layer), be sure to carry out foundation improvement work.
7. Fix the co-generation main unit with anchor bolts to prevent falls and to make the base firm and horizontal.
8. When installing the unit in places such as on a roof, rooftop or balcony where noise or vibration may become an issue, use anti-vibration mounts.
9. Observe any relevant local laws and regulations related to the installation of the unit.

REMEHA ENER-G10 TECHNICAL SPECIFICATION

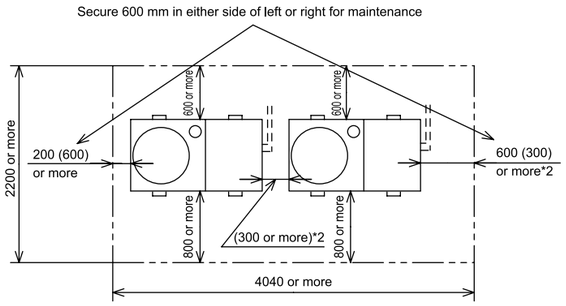
INSTALLATION SPACE

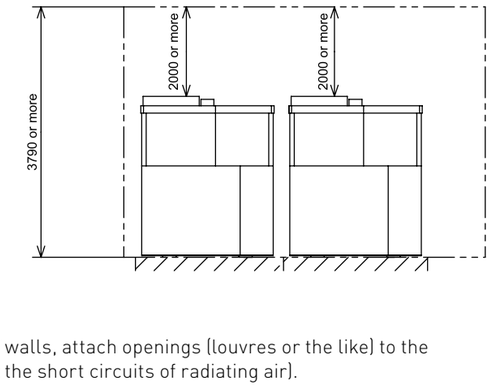
1. Single Unit Installation





2. Multiple Units Installation





Notes

1. When surrounding the unit with soundproof walls, attach openings (louvres or the like) to the bottom of the soundproof walls. (To prevent the short circuits of radiating air).
2. Decide installation space after consideration of the piping space.
3. If the distance of retention is specified by local-government fire prevention ordinances and enforcement regulations, secure the installation space according to these regulations.
4. Give consideration not to cause problems for neighbouring houses due to operating noise, radiating air, or hot ventilation air.
5. Depending on the situation, the site may be filled with radiating air and this has an effect on performance. Prevent the short circuits with the optional wind direction boards, etc.

ENER-G10 DATASHEET

General Description	
Fuel Type	Natural Gas
Minimum Methane Number	80
Electrical Output	10kW
Heat Output (Exhaust Cooled to 77°C)	17kW
Fuel Input Net/Gross (CV 10kWh/Nm³)	32/36 kW
Min/Max Dynamic Gas Pressure	10/25C mbar
Max Return/Flow Water Temp:	68/78°C
Unit Efficiency	84.5%

Prime Mover	
Type	Reciprocating Engine
Combustion Cycle	4-stroke Spark Ignition
Cylinders	3
Speed	1700
NOx Emissions	653 mg/Nm³
CO Emissions	21 mg/Nm³
Aspiration	Natural

Generator	
Type	PMG DC & DC/AC Inverter
Frequency	50 Hz
Voltage	400 V
Phase(s)	3-Phase

Heat Recovery System
Fully closed primary water circuit
Exhaust gas heat exchanger in primary circuit
PHE between primary and secondary circuits.
Primary water pump
Auto heat output modulation

Control and Protection
On board computer control, protection and monitoring
Engine stop/start, synchronising, modulation
Mechanical, electrical and thermal protection
BMS interface signals

Standard Equipment
Internal Exhaust silencers
Secondary water pump

Optional Equipment/Configuration:
Export control panel
Remote monitoring
Heat and gas metering
System controller
Anti-vibration mounts
Exhaust extension kit

Electrical output is based on output at the generator terminals at a power factor of 0.95. Energy quantities subject to reduction when modulating in response to external conditions. We reserve the right to alter the Engine Type, at any time, to meet the system specifications. Performance figures are subject to original Engine manufacturer's declared performance, tolerances and test conditions. Output figures are based on operation at ISO3046 conditions with the exception of the exhaust output, temperature stated above. Technical Datasheets are subject to change, without notice, due to our commitment to on-going product improvement.

REMEHA ENER-G10 TECHNICAL SPECIFICATION

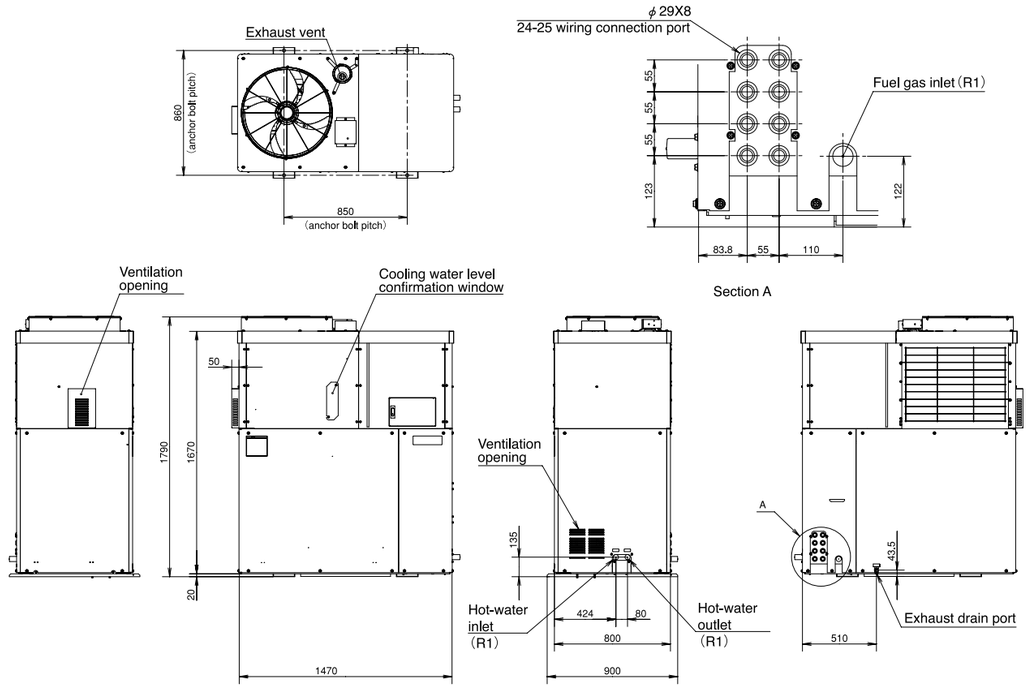
ENER-G25

Boiler Model		**ENER-G25**
Product Code		CP25WE
Dimensions W x D x H	mm	2150 x 800 (900 including protrusion) x 2010 (2060 including cover)
Net Weight	kg	1320 (including cooling water and lubricant)
Rated Output	kW	25.0
Frequency	Hz	50
Voltage	V	400
Current	A per phase	35.4
Phase/Wires		Three phase, four wires
Power Factor	%	97 or more
Recovered Heat	kW	38.4
Hot Water Temperature Outlet	°C	Max 85
Hot Water Flow Rate	L/min	110
Overall Efficiency	%	85.0
Electrical Generation Efficiency	%	33.5
Exhaust Heat Recovery Ratio	%	51.5
Sound Pressure Level during Rated Load		
Radiator Fan Stopped	dB (A)	62
Radiator Fan Operating	dB (A)	64
—	dB (A)	—
Voltage	V	AC 200
Startup Current	A	46.0 (average electric current)
Power Consumption (Rated)		
Radiator Fan Stopped	kW	0.93
Radiator Fan Operating	kW	1.35
Space Heater (below 5°C)	dB (A)	0.75 (for cold regions)
Fuel Consumption (LHV basis)	kW	74.6
Gas Supply Pressure		
Natural Gas	kPa	1.5 ~ 3.0
Gas Engine		4GPF98-C1
Type		Vertical cylinder, 4-cycle water-cooled gas engine
Cylinder Bore x Stroke	mm	4
Displacement	L	3.318
Rated Output	kW	27.3
Engine Speed	min^{-1}	1,900
Catalyser		Oxiside Catalyser
Starter System		Electric starting by AC/DC conversion
Lubricant Type		YANMAR's Genuine T Oil for GHP (10W30)
System Lubricant Capacity	L	66 (including 40 sub-tanks and 26 main tanks)
Inverter		GS Yuasa Corporation LGU-25-T3E
Rated Output	kW	25
Main Circuit System Inverter		Self-excited voltage-type current control system
Main Circuit Switching System		PWM System
Main Circuit Insulation System		Non-insulated transformer-less system (Pressure rising chopper system)
Power Control		Output power constant control system
Reverse Power Prevention Control		Reverse power flow prevention control by measuring reverse power flow
Coolant		Coolant H209 for cogeneration
Concentration of Coolant - Standard	%	50
Concentration of Coolant - Cold Area	%	60
Cooling Water Capacity		31.5 (including the reserve tank)
Cooling Water Pump Type		Magnet driving system spiral type
Generator Type		Open type
Phase/Wires		Three-phase, three-wires
Number of Poles		16
Excitation System		Permanent magnet system
Insulation Class / Armature Coil		F type
Bearing System		Bearingless
Transformer for Starting Input Voltage	V	AC200
Electric Motor for Starting	V	DC12
Heat Exchanger Type		Brazing plate system
Heat Exchanger Plate Material		Stainless
Pressure Proof Secondary Side	MPa	0.8
Maintenance Interval	Hours	10,000
Conditions for Use		
Ambient Temperature	°C	-5 ~ +40 (for cold area -15 ~ +40)
Relative Humidity	%	80 or less
Altitude (above sea level)	m	300 or less

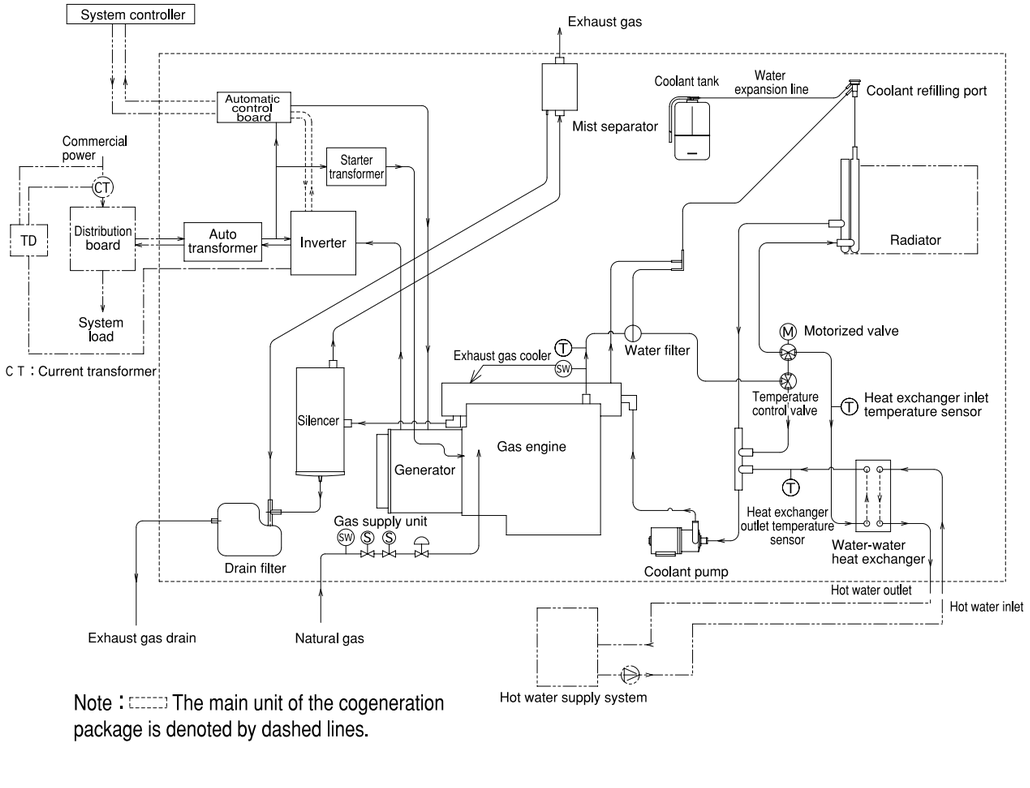
1 The heat recovery and efficiency values are those for rated output in standard atmospheric conditions.
2 The operating sound levels are maximum values measured in 4 directions at a point 1m from the side of the unit and 1.2m above the ground in an anechoic room simulation. The sound levels during actual operation are usually higher than the simulated values due to ambient noise and echoes.
3 The values for the external dimensions do not include piping, piping connections, or protruding parts.
4 The amount of fuel consumption is based on lower calorific values.

*1 Power consumption is included
*2 Max of +5%; 11ℓ/min
*3 Tolerance +5% is not included

GAS ENGINE UNIT



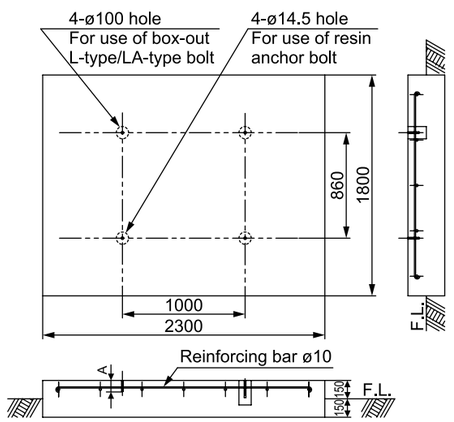
SYSTEM FLOWCHART



Note : The main unit of the cogeneration package is denoted by dashed lines.

DIMENSIONAL DRAWING OF BASE

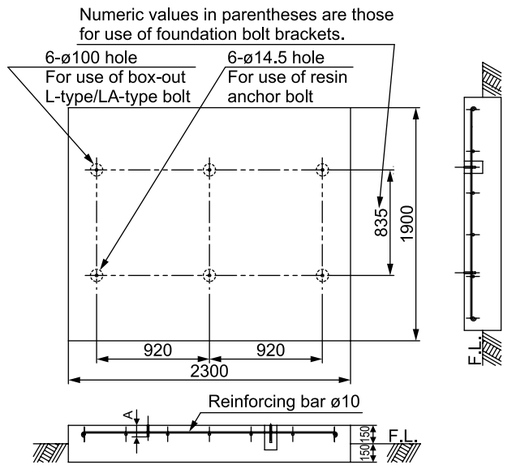
1. Direct Mount



When the unit is installed indoors, a syphon (option) should be installed.

If the back pressure of the exhaust-piping extension exceeds 500Pa, use a long syphon and make the height of the base from F.L. to 250mm or more.

2. Anti-Vibration Mount



Notes:

1 For use of box-out L-type/LA-type bolt.
When laying the concrete for the base, provide a box-out for fixing the anchor bolts, fix the anchor bolts and then secure them in the concrete.

2 It is sometimes necessary to change the thickness of the base depending on the foundation strength, so carry out the work after consulting construction engineers.

3 Earthquake-resistance strength: Horizontal seismic coefficient of 0.6 (Numeric values with * show the dimensions in the case of a horizontal seismic coefficient 1.0).

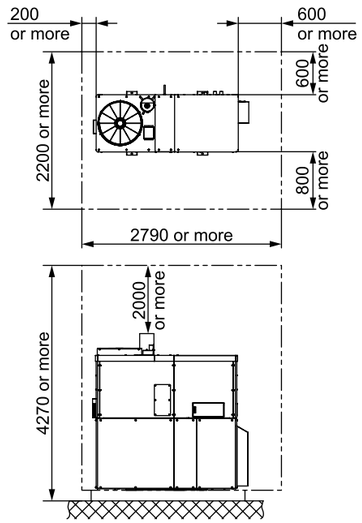
4 When using a smaller base, join the base and the structure with reinforcing bars.

Type of Anchor Bolt	Size	Embedded Depth A (mm)	
		Direct Mount	Anti-Vibration Mount
L-type/LA-type	M12	90mm min.	120mm min.
Resin		50mm min.	60mm min.
Male screw mechanical		80mm min.	80mm min.

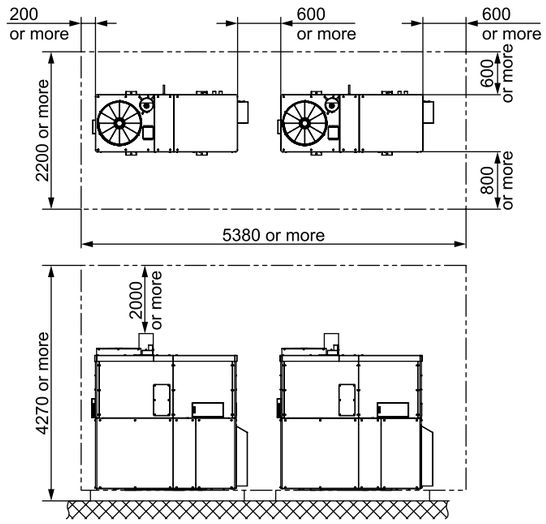
REMEHA ENER-G25 TECHNICAL SPECIFICATION

INSTALLATION SPACE

1. Single Unit Installation



2. Multiple Units Installation



Unit: mm

Notes

1. When surrounding the unit with soundproof walls, attach openings (louvres or the like) to the bottom of the soundproof walls. (To prevent the short circuits of radiating air).
2. Decide installation space after consideration of the piping space.
3. If the distance of retention is specified by local-government fire prevention ordinances and enforcement regulations, secure the installation space according to these regulations.
4. Give consideration not to cause problems for neighbouring houses due to operating noise, radiating air, or hot ventilation air.
5. Depending on the situation, the site may be filled with radiating air and this has an effect on performance. Prevent the short circuits with the optional wind direction boards, etc.

ENER-G25 DATASHEET

General Description	
Fuel Type	Natural Gas
Minimum Methane Number	80
Electrical Output	25kW
Heat Output (Exhaust Cooled to 124°C)	38kW
Fuel Input Net/Gross (CV 10kWh/Nm³)	75/82 kW
Min/Max Dynamic Gas Pressure	15/30 mbar
Max Return/Flow Water Temp:	75/85°C
Unit Efficiency	85.2%

Prime Mover	
Type	Reciprocating Engine
Combustion Cycle	4-stroke Spark Ignition
Cylinders	4
Speed	1900
NOx Emissions	542 mg/Nm³
CO Emissions	634 mg/Nm³
Aspiration	Natural

Generator	
Type	PMG DC & DC/AC Inverter
Frequency	50 Hz
Voltage	400 V
Phase(s)	3-Phase

Heat Recovery System
Fully closed primary water circuit
Exhaust gas heat exchanger in primary circuit
PHE between primary and secondary circuits
Primary water pump
Auto heat output modulation

Control and Protection
On board computer control, protection and monitoring
Engine stop/start, synchronising, modulation
Mechanical, electrical and thermal protection
BMS interface signals

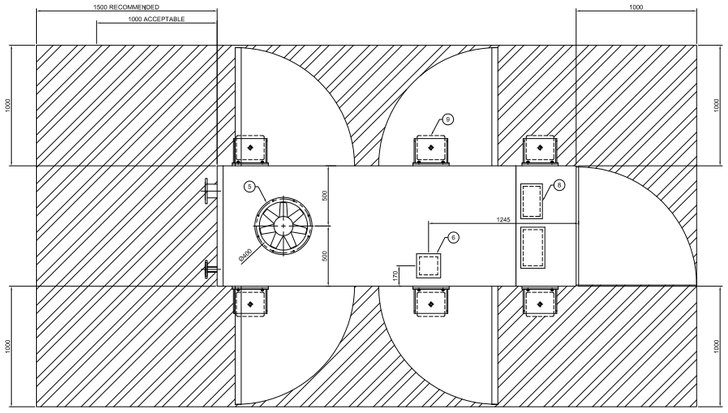
Standard Equipment
Internal Exhaust silencers
Secondary water pump

Optional Equipment/Configuration:
Export control panel
Remote monitoring
Heat and gas metering
System controller
Anti-vibration mounts
Exhaust extension kit

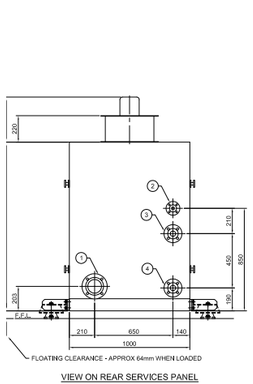
Electrical output is based on output at the generator terminals at a power factor of 0.95. Energy quantities subject to reduction when modulating in response to external conditions. We reserve the right to alter the Engine Type, at any time, to meet the system specifications. Performance figures are subject to original Engine manufacturer's declared performance, tolerances and test conditions. Output figures are based on operation at ISO3046 conditions with the exception of the exhaust output, temperature stated above. Technical Datasheets are subject to change, without notice, due to our commitment to on-going product improvement.

INSTALLATION SPACE

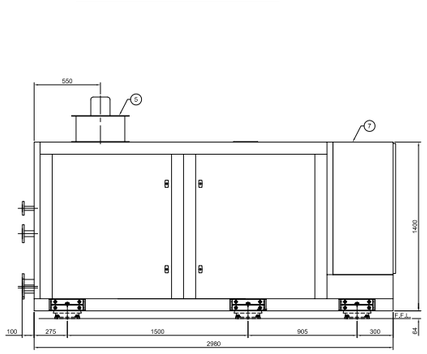
Installation Clearance Recommendations



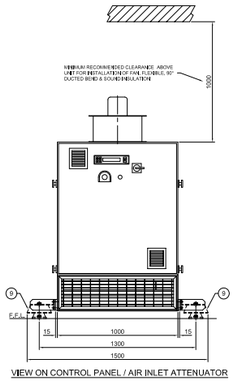
INSTALLATION CLEARANCE RECOMMENDATIONS



VIEW ON REAR SERVICES PANEL



VIEW ON ELEVATION



VIEW ON CONTROL PANEL / AIR INLET ATTENUATOR

Item No.	Description	Qty
1	100NS PN6 Flanged Exhaust CHP Outlet	1
2	25NS PN16 Flanged Natural Gas CHP Inlet	1
3	40NS PN16 Flanged Heating Water CHP Inlet	1
4	40NS PN16 Flanged Heating Water CHP Outlet	1
5	Enclosure Fan Outlet Ø400 with 8x Ø12 Holes Equally Spaced on 450mm P.C.D.	1
6	Oil Fill Point	1
7	Control Panel	1
8	Main Cable Gland Plate	1
9	Anti-Vibration Mounts and Removable Pick up Plates (if required)	6

Enclosure Type	Total Dry Weight kg (Approx)	Total Wet Weight kg (Approx)
Standard	2450kg	2600kg
Premium	2550kg	2700kg

Notes

1. Recommended clearance for service access is 1000mm on sides, 1250mm above, 1000mm at front and 1500mm at rear (pipework connections end) although 1000mm is acceptable.
2. Consideration must be given on installation design as to whether acoustic treatment may be required to fans etc. which may add height to the design although this is site specific.
3. Anti-vibration mounts are shown hidden as they may not be required on certain sites and are removable for installation.

ENER-G35

Energy Balance and Part Load Data @ 0.95PF		Units	100%	75%	50%
Electrical Output	(+/-3%)	kW	35	26	18
Electrical Efficiency (Net)	(+/-5%)	%	31.2	28.7	24.7
Heat Output	(+/-10%)	kW	62	52	42
Thermal Efficiency (Net)	(+/-8%)	%	55.1	56.6	59.1
Fuel Input (Net)	(+/-5%)	kW	112	92	71
Total Efficiency (Net)	(+/-8%)	%	86.2	85.3	83.8
Heat Output from Jacket Water	(+/-8%)	kW	38	34	29
Heat Output from Exhaust Gas @ Outlet Temp.	(+/-8%)	kW	24	18	13
Aftercooler Heat Output	(+/-8%)	kW	N/A	N/A	N/A
Radiated Heat Output	(+/-8%)	kW	9	7	5
Combustion Air Flow	(+/-5%)	Nm^3/h	106	87	67
Fuel Mass Flow (p = 0.75kg/Nm^3)	(+/-5%)	kg/h	8.4	6.9	5.3
Fuel Volume Flow (LHV = 10kWh/Nm^3)	(+/-5%)	Nm^3/h	11.2	9.2	7.1
Exhaust Mass Flow (Wet)	(+/-5%)	kg/h	146	119	92
Exhaust Volume Flow @ Outlet Temp	(-+/-5%)	m^3/h	162	132	102

Engine Details		
Manufacturer		MAN
Model		E 0834 E 302
Fuel Type		Natural Gas
Min. Methane Number		80
Cylinders		4
Aspiration		Natural
Speed	rpm	1500
Aftercooler		No
Hot Water Details		
Max. Water In/Out Temp.	°C	80/90
Max. Water Flow Rate*	l/s	1.56
Max. Glycol Content	%	0
Connection Size	mm	50
Flange Type		PN16
Pressure Loss**	kPa	4
Max. Test Pressure	Bar	10
Exhaust Details		
Connection Size	mm	100
Flange Type		PN6
Outlet Temp.	°C	120
Max. Allowable Back pressure	Bar	10
Ventilation Details		
Connection Size	mm	500
Ventilation Rate	m^2/s	0.79
Max. Air Inlet Temp.	°C	30
Max. Air Outlet Temp.	°C	45

*Assuming Cp = 3.91 kj/kg·K and p = 1014.64 kg/m3
**Pressure loss figures stated are at max. water flow rate. Internal unit only.

Generator Details		
Manufacturer		Meccalite
Model		ECO 32-3L/4
Type		Synchronous
Rating	kVA	75
Voltage	V	400
Phase	Ph	3
Frequency	Hz	50
Protection Class		IP21
Rated Power Factor	PF	0.8
Xd Dir. Axis Synchronous		305.4
X'd Dir. Axis Transient		13.4
X"d Dir Axis Sub-Transient		7
T"Sub-Transient Time. Const.		0.0135
T'do O.C. Field Time Const.		1.3
CHP Protection Device	A/Ph	80
Indicative Client Protection Device	A/Ph	80 (Adjustable)
Current Per Phase @ 0.8PF	A	63
Current Per Phase @ 0.95PF	A	53
Efficiency @ 0.8PF	%	90.3
Efficiency @ 0.95PF	%	91.1
Indicative Main Cable Size[a†]	mm^2	TBC
Indicative Earth Cable Size[b†]	mm^2	TBC
Fuel Details		
Connection Size	mm	40
Flange Type		PN16
Min/Max Supply Pressure	mbar	20/45
Emissions @ 5% O2		
NOx	mg/Nm^2	6500
CO	mg/Nm^2	6500
NOx (with catalyst)	mg/Nm^2	250
CO (with catalyst)	mg/Nm^2	350
Weight Details		
Enclosure (Dry) STD/PREM	kg	3000/4000
Container (Dry) STD/PREM	kg	7100/7600
Noise Data		
Enclosure SPL @ 1m SN/LN	dB(A)	70/65
Container SPL @ 1m SN/LN	dB(A)	75/65

a 4-Core XLPE/SWA/PVC to BS5467, max 50 metres.
b 1-Core 6491B to BS7211, max 50 metres.
† Sizes and lengths based on IET 17th Edition BS7671, Installation method 31.

NB: Energy balance data assumes perfect combustion. Values for part load are estimates only. All information detailed is for guidance only and is subject to change without notice due to our commitment to continuous improvement – all values should be confirmed with ENER-G Combined Ltd on a project specific basis.

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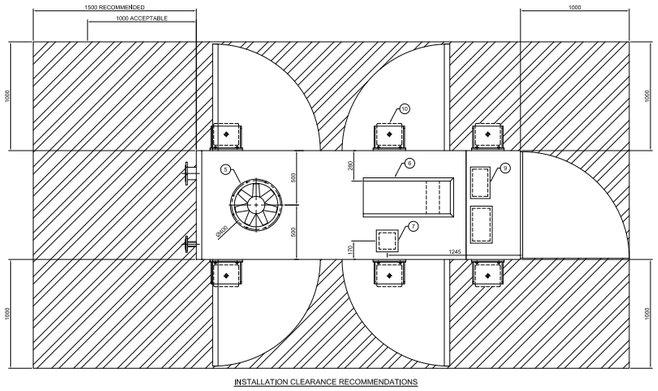
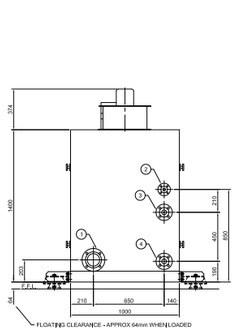
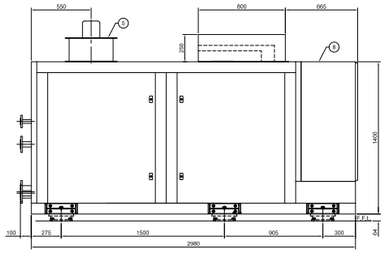
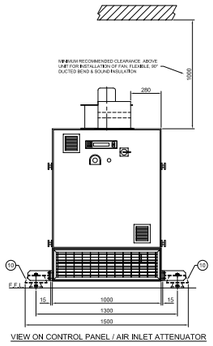
INSTALLATION SPACE

Installation Clearance Recommendations








MINIMUM RECOMMENDED CLEARANCE ABOVE UNIT FOR INSTALLATION OF FAN, FLEXIBLE 90° DUCTED BEND & SOUND INSULATION
1000
280
1000
1300
1500
VIEW ON CONTROL PANEL / AIR INLET ATTENUATOR

Item No.	Description	Qty
1	100NS PN6 Flanged Exhaust CHP Outlet	1
2	25NS PN16 Flanged Natural Gas CHP Inlet	1
3	40NS PN16 Flanged Heating Water CHP Inlet	1
4	40NS PN16 Flanged Heating Water CHP Outlet	1
5	Enclosure Fan Outlet Ø400 with 8x Ø12 Holes Equally Spaced on 450mm P.C.D.	1
6	Combustion Air Inlet Attenuator	1
7	Oil Fill Point	
8	Control Panel	1
9	Main Cable Gland Plate	1
10	Anti-Vibration Mounts and Removable Pick up Plates (if required)	6

Enclosure Type	Total Dry Weight kg (Approx)	Total Wet Weight kg (Approx)
Standard	2450kg	2600kg
Premium	2550kg	2700kg

Notes

1. Recommended clearance for service access is 1000mm on sides, 1250mm above, 1000mm at front and 1500mm at rear (pipework connections end) although 1000mm is acceptable.
2. Consideration must be given on installation design as to whether acoustic treatment may be required to fans etc. which may add height to the design although this is site specific.
3. Anti-vibration mounts are shown hidden as they may not be required on certain sites and are removable for installation.

ENER-G50 DATASHEET

Energy Balance and Part Load Data @ 0.95PF		Units	100%	75%	50%
Electrical Output	(+/-3%)	kW	50	37	25
Electrical Efficiency (Net)	(+/-5%)	%	33.7	31.7	28.2
Heat Output	(+/-10%)	kW	79	65	50
Thermal Efficiency (Net)	(+/-8%)	%	53.4	54.8	56.9
Fuel Input (Net)	(+/-5%)	kW	148	118	89
Total Efficiency (Net)	(+/-8%)	%	87.1	86.5	85.1
Heat Output from Jacket Water	(+/-8%)	kW	46	39	33
Heat Output from Exhaust Gas @ Outlet Temp.	(+/-8%)	kW	33	25	17
Aftercooler Heat Output	(+/-8%)	kW	N/A	N/A	N/A
Radiated Heat Output	(+/-8%)	kW	12	9	7
Combustion Air Flow	(+/-5%)	Nm^3/h	140	112	84
Fuel Mass Flow (p = 0.75kg/Nm^3)	(+/-5%)	kg/h	11.1	8.9	6.6
Fuel Volume Flow (LHV = 10kWh/Nm^3)	(+/-5%)	Nm^3/h	14.8	11.8	8.9
Exhaust Mass Flow (Wet)	(+/-5%)	kg/h	192	153	115
Exhaust Volume Flow @ Outlet Temp	(-+/-5%)	m^3/h	214	171	128

Engine Details		
Manufacturer		MAN
Model		E 0834 E 302
Fuel Type		Natural Gas
Min. Methane Number		80
Cylinders		4
Aspiration		Natural
Speed	rpm	1500
Aftercooler		No
Hot Water Details		
Max. Water In/Out Temp.	°C	80/90
Max. Water Flow Rate*	l/s	1.99
Max. Glycol Content	%	0
Connection Size	mm	50
Flange Type		PN16
Pressure Loss**	kPa	8.3
Max. Test Pressure	Bar	10
Exhaust Details		
Connection Size	mm	100
Flange Type		PN6
Outlet Temp.	°C	120
Max. Allowable Back pressure	Pa	2640
Ventilation Details		
Connection Size	mm	500
Ventilation Rate	m^2/s	1.01
Max. Air Inlet Temp.	°C	30
Max. Air Outlet Temp.	°C	45

*Assuming Cp = 3.91 kj/kg·K and p = 1014.64 kg/m3
**Pressure loss figures stated are at max. water flow rate. Internal unit only.

Generator Details		
Manufacturer		Meccalite
Model		ECO 32-3L/4
Type		Synchronous
Rating	kVA	75
Voltage	V	400
Phase	Ph	3
Frequency	Hz	50
Protection Class		IP21
Rated Power Factor	PF	0.8
Xd Dir. Axis Synchronous		305.4
X'd Dir. Axis Transient		13.4
X"d Dir Axis Sub-Transient		7
T"Sub-Transient Time. Const.		0.0135
T'do O.C. Field Time Const.		1.3
CHP Protection Device	A/Ph	100
Indicative Client Protection Device	A/Ph	100 (Adjustable)
Current Per Phase @ 0.8PF	A	89
Current Per Phase @ 0.95PF	A	76
Efficiency @ 0.8PF	%	91.1
Efficiency @ 0.95PF	%	92.4
Indicative Main Cable Size[a†]	mm^2	TBC
Indicative Earth Cable Size[b†]	mm^2	TBC
Fuel Details		
Connection Size	mm	40
Flange Type		PN16
Min/Max Supply Pressure	mbar	20/45
Emissions @ 5% O2		
NOx	mg/Nm^2	6500
CO	mg/Nm^2	6500
NOx (with catalyst)	mg/Nm^2	250
CO (with catalyst)	mg/Nm^2	350
Weight Details		
Enclosure (Dry) STD/PREM	kg	3000/4000
Container (Dry) STD/PREM	kg	7100/7600
Noise Data		
Enclosure SPL @ 1m SN/LN	dB(A)	70/65
Container SPL @ 1m SN/LN	dB(A)	75/65

a 4-Core XLPE/SWA/PVC to BS5467, max 50 metres.
b 1-Core 6491B to BS7211, max 50 metres.
† Sizes and lengths based on IET 17th Edition BS7671, Installation method 31.

NB: Energy balance data assumes perfect combustion. Values for part load are estimates only. All information detailed is for guidance only and is subject to change without notice due to our commitment to continuous improvement – all values should be confirmed with ENER-G Combined Ltd on a project specific basis.

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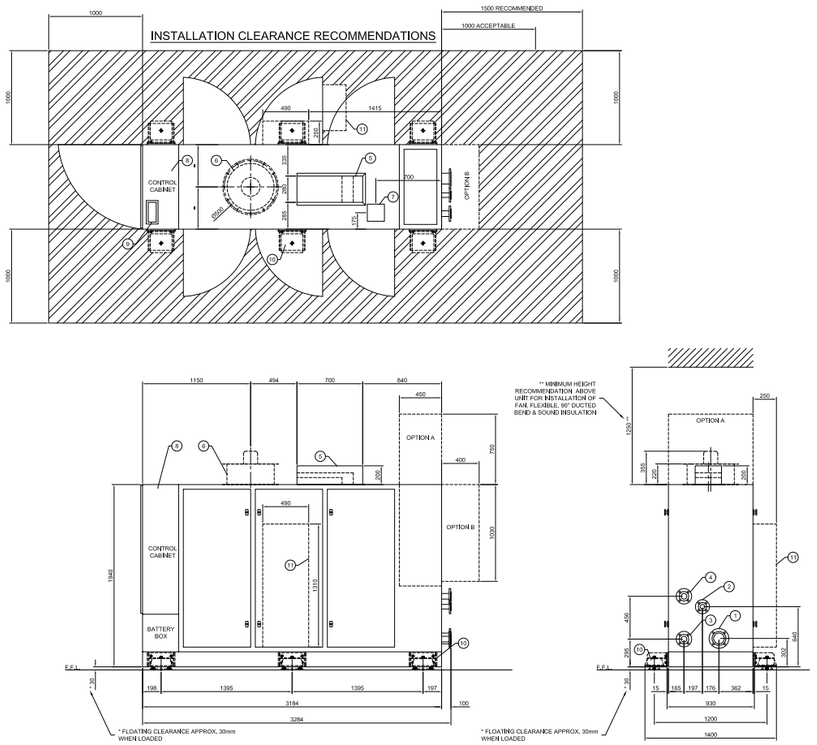
INSTALLATION SPACE

Installation Clearance Recommendations


INSTALLATION CLEARANCE RECOMMENDATIONS
1000
1000 RECOMMENDED
1000 ACCEPTABLE
CONTROL CABINET
OPTION B
OPTION A
BATTERY BOX
** MINIMUM HEIGHT RECOMMENDATION ABOVE UNIT FOR INSTALLATION OF FAN, FLEXIBLE, 90° DUCTED BEND & SOUND INSULATION
* FLOATING CLEARANCE APPROX. 30mm WHEN LOADED

Item No.	Description	Qty
1	100NS PN6 Flanged Exhaust CHP Outlet	1
2	40NS PN16 Flanged Natural Gas CHP Inlet	1
3	50NS PN16 Flanged Heating Water CHP Inlet	1
4	50NS PN16 Flanged Heating Water CHP Outlet	1
5	Combustion Air Inlet Filter (Removable for Installation)	1
6	Enclosure Fan Outlet Ø500 with 12No. x Ø12 Holes Equally Spaced on 560mm P.C.D. (Removable for Installation)	1
7	Oil Fill Point	1
8	Control Panel	1
9	Main Cable Gland Plate	1
10	Anti-Vibration Mounts and Removable Pick up Plates (if required)	6
11	Catalyst Door Bulge in Enclosure (If Catalyst is Required)	1

Enclosure Type	Totally Dry Weight kg (Approx)	Total Wet Weight kg (Approx)
Standard	3000kg	3170kg
Premium	3200kg	3370kg

Notes

1. Recommended clearance for service access is 1000mm on sides, 1250mm above, 1000mm at front and 1500mm at rear (pipework connections end) although 1000mm is acceptable.
2. Consideration must be given on installation design as to whether acoustic treatment may be required to fans etc. which may add height to the design although this site is site specific.
3. Anti-vibration mounts are shown hidden as they may not be required on certain sites and are removable for installation.
4. Bulge in door is shown hidden due to it is only required on units fitted with a catalyst. If no catalyst is fitted then the door remains flush.

ENER-G70 DATASHEET

General Description	
Enclosure Type	Internal
Fuel Type	Natural Gas
Minimum Methane Number	80
Electrical Output	70kW
Heat Output (Exhaust Cooled to 120°C)	109kW
Fuel Input Net/Gross (CV 10kWh/Nm³)	204/226kW
Min/Max Dynamic Gas Pressure	20/45mbar
Max Return/Flow Water Temp:	80/90°C

Prime Mover	
Type	Reciprocating Engine
Combustion Cycle	4-stroke Spark Ignition
Cylinders	6
Speed	1500
NOx Emissions with/without Cat	250/7000 mg/Nm³
CO Emissions with/without Cat	350/5000 mg/Nm³
Aspiration	Natural

Generator	
Type	Synchronous
Frequency	50 Hz
Voltage	400 V
Efficiency	94.1%

Heat Recovery System
Fully closed primary water circuit
Exhaust gas heat exchanger in primary circuit
PHE between primary and secondary circuits
Primary water pump
Auto heat output modulation

Control and Protection
On board computer control, protection and monitoring
Engine stop/start, synchronising, modulation
Mechanical, electrical and thermal protection
70+ parameters monitored, historical data recorded
2 way communication between unit and head office
BMS interface signals

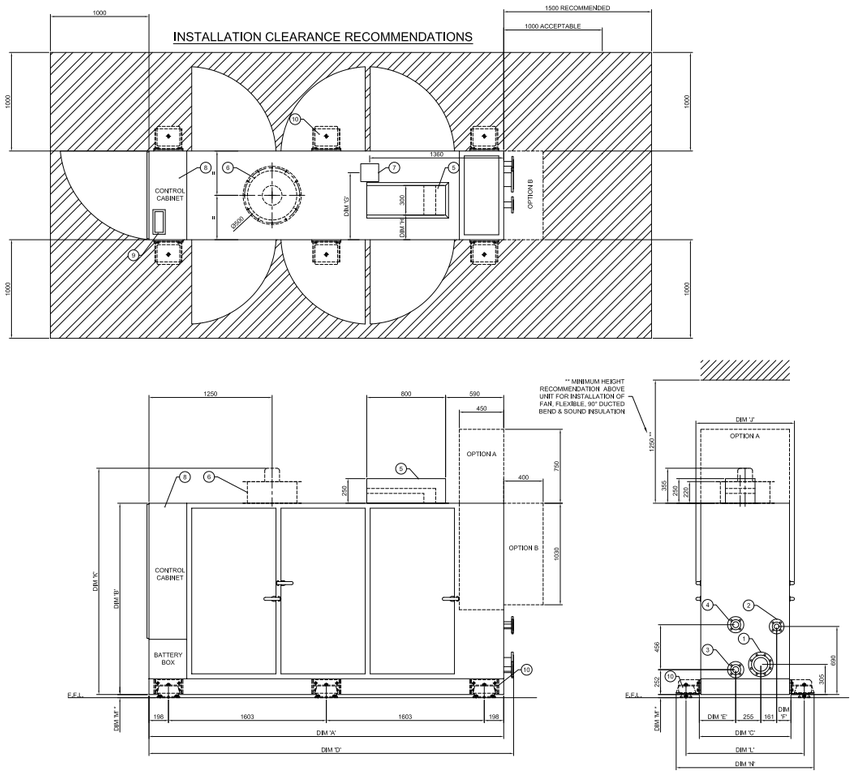
Standard Equipment
Exhaust silencers (industrial and residential grade)
Secondary water pump

Optional Equipment/Configuration:
Heat rejection equipment/controls
Low noise acoustic enclosure/container
Export control panel
Heat and gas metering
Modbus Interface Card
Catalytic converters for very low emissions
Generator only (no heat recovery)
Island mode operation
CHP absorption chiller packages

Electrical output is based on output at the generator terminals at a power factor of 0.95. Energy quantities subject to reduction when modulating in response to external conditions. We reserve the right to alter the Engine Type, at any time, to meet the system specifications. Performance figures are subject to original Engine manufacturer's declared performance, tolerances and test conditions. Output figures are based on operation at ISO3046 conditions with the exception of the exhaust output, temperature stated above. Technical Datasheets are subject to change, without notice, due to our commitment to on-going product improvement.

INSTALLATION SPACE

Installation Clearance Recommendations



Item No.	Description	Qty
1	125NS PN16 Flanged Exhaust CHP Outlet	1
2	40NS PN16 Flanged Natural Gas CHP Inlet	1
3	50NS PN16 Flanged Heating Water CHP Inlet	1
4	50NS PN16 Flanged Heating Water CHP Outlet	1
5	Combustion Air Inlet Filter (Removable for Installation)	1
6	Enclosure Fan Outlet Ø500 with 12No. x Ø12 Holes Equally Spaced on 560mm P.C.D. (Removable for Installation)	1
7	Oil Fill Point	1
8	Control Panel	1
9	Main Cable Gland Plate	1
10	Anti-Vibration Mounts and Removable Pick up Plates (if required)	6

CHP Enclosure Type Dimension Table			
Dimension Ref.	**Standard**	**Premium**	**Shipping & Install Notes**
A	3600mm	3650mm	
B	1940mm	1990mm	Shipping Height
C	930mm	1030mm	
D	3700mm	3725mm	Shipping & Installation Length
E	369mm	419mm	
F	145mm	195mm	
G	680mm	730mm	
H	250mm	300mm	
J	950mm	1050mm	Shipping & Installation Width
K	2295mm	2345mm	Installation Height Exc. Ductwork
L	1200mm	1300mm	
M	30mm	30mm	(*)Approx Floating Clearance Dimension When Loaded
N	1400mm	1500mm	
Total Weight	3500kg	3900kg	Approx. Dry Weight (kg)
Total Weight	3700kg	4100kg	Approx. Wet Weight (kg)

Notes

1. Recommended clearance for service access is 1000mm on sides, 1250mm above, 1000mm at front and 1500mm at rear (pipework connections end) although 1000mm is acceptable.
2. Consideration must be given on installation design as to whether acoustic treatment may be required to fans etc. which may add height to the design although this is site specific.
3. Anti-vibration mounts are shown hidden as they may not be required on certain sites and are removable for installation.

ENER-G90 DATASHEET

Energy Balance and Part Load Data @ 0.95PF		Units	100%	75%	50%
Electrical Output	(+/-3%)	kW	90	68	45
Electrical Efficiency (Net)	(+/-5%)	%	32.2	29.8	26.0
Heat Output	(+/-10%)	kW	161	136	110
Thermal Efficiency (Net)	(+/-8%)	%	57.6	59.8	63.3
Fuel Input (Net)	(+/-5%)	kW	280	227	173
Total Efficiency (Net)	(+/-8%)	%	89.8	89.6	89.2
Heat Output from Jacket Water	(+/-8%)	kW	110	97	83
Heat Output from Exhaust Gas @ Outlet Temp.	(+/-8%)	kW	51	39	27
Aftercooler Heat Output	(+/-8%)	kW	N/A	N/A	N/A
Radiated Heat Output	(+/-8%)	kW	10	8	6
Combustion Air Flow	(+/-5%)	Nm^3/h	266	215	165
Fuel Mass Flow (p = 0.75kg/Nm^3)	(+/-5%)	kg/h	21.0	17.0	13.0
Fuel Volume Flow (LHV = 10kWh/Nm^3)	(+/-5%)	Nm^3/h	28.0	22.7	17.3
Exhaust Mass Flow (Wet)	(+/-5%)	kg/h	368	298	228
Exhaust Volume Flow @ Outlet Temp	(-+/-5%)	m^3/h	410	332	254

Engine Details		
Manufacturer		ENER-G
Model		EGE-06L
Fuel Type		Natural Gas
Min. Methane Number		70
Cylinders		6
Aspiration		Natural
Speed	rpm	1500
Aftercooler		No
Hot Water Details		
Max. Water In/Out Temp.	°C	80/90
Max. Water Flow Rate*	l/s	4.06
Max. Glycol Content	%	30
Connection Size	mm	50
Flange Type		PN16
Pressure Loss**	kPa	11
Max. Test Pressure	Bar	10
Exhaust Details		
Connection Size	mm	125
Flange Type		PN16
Outlet Temp.	°C	120
Max. Allowable Back pressure	Pa	3570
Ventilation Details		
Connection Size	mm	500
Ventilation Rate	m^2/s	1.24
Max. Air Inlet Temp.	°C	30
Max. Air Outlet Temp.	°C	45

*Assuming Cp = 3.91 kj/kg·K and p = 1014.64 kg/m3
**Pressure loss figures stated are at max. water flow rate. Internal unit only.

Generator Details		
Manufacturer		Stamford
Model		UCI274H-311
Type		Synchronous
Rating	kVA	200
Voltage	V	400
Phase	Ph	3
Frequency	Hz	50
Protection Class		IP23
Rated Power Factor	PF	0.8
Xd Dir. Axis Synchronous		1.91
X'd Dir. Axis Transient		0.16
X"d Dir Axis Sub-Transient		0.11
T"Sub-Transient Time. Const.		0.012
T'do O.C. Field Time Const.		1.1
CHP Protection Device	A/Ph	160
Indicative Client Protection Device	A/Ph	160 (Adjustable)
Current Per Phase @ 0.8PF	A	162
Current Per Phase @ 0.95PF	A	137
Efficiency @ 0.8PF	%	93.9
Efficiency @ 0.95PF	%	94.9
Indicative Main Cable Size[a†]	mm^2	TBC
Indicative Earth Cable Size[b†]	mm^2	TBC
Fuel Details		
Connection Size	mm	40
Flange Type		PN16
Min/Max Supply Pressure	mbar	20/55
Emissions @ 5% O2		
NOx	mg/Nm^2	3676
CO	mg/Nm^2	2163
NOx (with catalyst)	mg/Nm^2	250
CO (with catalyst)	mg/Nm^2	350
Weight Details		
Enclosure (Dry) STD/PREM	kg	4600/6000
Container (Dry) STD/PREM	kg	TBC/TBC
Noise Data		
Enclosure SPL @ 1m SN/LN	dB(A)	70/65
Container SPL @ 1m SN/LN	dB(A)	75/65

a 4-Core XLPE/SWA/PVC to BS5467, max 50 metres.
b 1-Core 6491B to BS7211, max 50 metres.
† Sizes and lengths based on IET 17th Edition BS7671, Installation method 31.

NB: Energy balance data assumes perfect combustion. Values for part load are estimates only. All information detailed is for guidance only and is subject to change without notice due to our commitment to continuous improvement – all values should be confirmed with ENER-G Combined Ltd on a project specific basis.

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September 2014

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